

WHAT IS CLAIMED IS:

1. A semiconductor device comprising:
  - a pixel thin film transistor in a pixel portion;
  - a storage capacitor in the pixel portion; and
  - a column-shape spacer in the pixel portion;the pixel thin film transistor including:
  - a first region of a semiconductor film having a channel forming region, a source region and a drain region;
  - a gate insulating film being in contact with the first region; and
  - a gate electrode being formed on the gate insulating film;the storage capacitor including:
  - a second region of the semiconductor film;
  - an insulating film being in contact with the second region; and
  - a storage wiring being formed on the insulating film,wherein the insulating film in contact with the second region has a thinner thickness than the gate insulating film in contact with the first region.
2. The semiconductor device according to claim 1,
  - wherein one layer in the gate electrode and the storage wiring comprises same material.
3. The semiconductor device according to claim 1,
  - wherein the storage wiring comprises at least one of aluminum (Al) and copper (Cu).
4. The semiconductor device according to claim 1,

wherein the pixel thin film transistor is an n-channel thin film transistor.

5. The semiconductor device according to claim 1,

wherein the semiconductor device is one selected from the group consisting of a personal computer, a video camera, a portable information terminal, a digital camera, a digital video disk player, , and a projector.

6. A semiconductor device comprising:

a pixel portion and a driver circuit portion being formed over a substrate;

a pixel thin film transistor in the pixel portion;

a storage capacitor in the pixel portion; and

a column-shape spacer in the pixel portion;

the pixel thin film transistor including:

a first region of a semiconductor film having a channel forming region, a source region and a drain region;

a gate insulating film being in contact with the first region; and

a gate electrode being formed on the gate insulating film;

the storage capacitor including:

a second region of the semiconductor film;

an insulating film being in contact with the second region; and

a storage wiring being formed on the insulating film,

wherein the insulating film in contact with the second region has a thinner thickness than the gate insulating film in contact with the first region.

7. The semiconductor device according to claim 6,

wherein one layer in the gate electrode and the storage wiring comprises same material.

8. The semiconductor device according to claim 6,  
wherein the storage wiring comprises at least one of aluminum (Al) and copper (Cu).

9. The semiconductor device according to claim 6,  
wherein the pixel thin film transistor is an n-channel thin film transistor.

10. The semiconductor device according to claim 6,  
wherein the semiconductor device is one selected from the group consisting of a personal computer, a video camera, a portable information terminal, a digital camera, a digital video disk player and a projector.

11. A semiconductor device comprising:  
an n-channel thin film transistor and a p-channel thin film transistor in a driver circuit; and  
a column-shape spacer in the pixel portion;  
the n-channel thin film transistor having a semiconductor film, a gate insulating film being on the semiconductor film, and a gate electrode on the gate insulating film;  
the semiconductor film including a channel forming region, a source region, and a drain region,  
wherein the gate electrode includes a first conductive layer and a second conductive layer on the first conductive layer.

12. The semiconductor device according to claim 11,

wherein the second conductive layer comprises at least one of aluminum (Al) and copper (Cu).

13. The semiconductor device according to claim 11,  
wherein the semiconductor device is one selected from the group consisting of a personal computer, a video camera, a portable information terminal, a digital camera, a digital video disk player and a projector.

14. A semiconductor device comprising:  
a pixel thin film transistor in a pixel portion; and  
a storage capacitor in the pixel portion;  
the pixel thin film transistor including:  
a first region of a semiconductor film having a channel forming region, an LDD region, a source region and a drain region;  
a gate insulating film being in contact with the first region;  
a gate electrode being formed on the gate insulating film;  
the storage capacitor including:  
a second region of the semiconductor film;  
an insulating film being in contact with the second region;  
a storage wiring being formed on the insulating film,  
wherein the insulating film in contact with the second region has a thinner thickness than the gate insulating film in contact with the first region.

15. The semiconductor device according to claim 14,  
wherein one layer in the gate electrode and the storage wiring comprises same material.

16. The semiconductor device according to claim 14,  
wherein the storage wiring comprises at least one of aluminum (Al) and copper (Cu).
17. The semiconductor device according to claim 14,  
wherein the pixel thin film transistor is an n-channel thin film transistor.
18. The semiconductor device according to claim 14,  
wherein a concentration of an element in the LDD region is reduced gradually along a direction from an end of the gate electrode toward the channel forming region.
19. The semiconductor device according to claim 14,  
wherein the semiconductor device is one selected from the group consisting of a personal computer, a video camera, a portable information terminal, a digital camera, a digital video disk player and a projector.
20. A semiconductor device comprising:  
a pixel portion and a driver circuit portion being formed over a substrate;  
a pixel thin film transistor in the pixel portion; and  
a storage capacitor in the pixel portion;  
the pixel thin film transistor including:  
a first region of a semiconductor film having a channel forming region, an LDD region, a source region and a drain region;  
a gate insulating film being in contact with the first region;  
a gate electrode being formed on the gate insulating film;  
the storage capacitor including:  
a second region of the semiconductor film;

an insulating film being in contact with the second region;  
a storage wiring being formed on the insulating film,  
wherein the insulating film in contact with the second region has a thinner thickness than the gate insulating film in contact with the first region.

21. The semiconductor device according to claim 20,  
wherein one layer in the gate electrode and the storage wiring comprises same material.

22. The semiconductor device according to claim 20,  
wherein the storage wiring comprises at least one of aluminum (Al) and copper (Cu).

23. The semiconductor device according to claim 20,  
wherein the pixel thin film transistor is an n-channel thin film transistor.

24. The semiconductor device according to claim 20,  
wherein a concentration of an element in the LDD region is reduced gradually along a direction from an end of the gate electrode toward the channel forming region.

25. The semiconductor device according to claim 20,  
wherein the semiconductor device is one selected from the group consisting of a personal computer, a video camera, a portable information terminal, a digital camera, a digital video disk player and a projector.

26. A semiconductor device comprising:

an n-channel thin film transistor and a p-channel thin film transistor in a driver circuit;

the n-channel thin film transistor having a semiconductor film, a gate insulating film on the semiconductor film, and a gate electrode on the gate insulating film;

the semiconductor film including a channel forming region, an LDD region, a source region, and a drain region,

wherein the gate electrode includes a first conductive layer and a second conductive layer.

27. The semiconductor device according to claim 26,  
wherein the storage wiring comprises at least one of aluminum (Al) and copper (Cu).

28. The semiconductor device according to claim 26,  
wherein a concentration of an element in the LDD region is reduced gradually along a direction from an end of the gate electrode toward the channel forming region.

29. The semiconductor device according to claim 26,  
wherein the semiconductor device is one selected from the group consisting of a personal computer, a video camera, a portable information terminal, a digital camera, a digital video disk player and a projector.